

INFLUENCE OF THE PROPOSED FLATNESS INDEX ON THE ELECTRICAL LENGTH OF A LONG LINE

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Abstract

Very long lines laid over deserts without intermediate Generating or Receiving stations need to be specially taken care to maintain as nearly constant voltage profile as possible. This can be achieved by installing a number of intermediate shunt compensating switching stations. In this connection some work was done and reported in the reference [1]. With given voltage constraints at both ends of the line, it was shown that the voltage profile over the entire length of the line takes the form of a hyperbola. This is analogous to the age old discovery that the sag of a line with mechanical constraints takes the form of a parabola. With this concept behind, a Flatness Index had been proposed and a formula derived for the same showing how the flatness increases with increase in number of compensating stations. This paper briefly reviews this theory and presents a slight extension to it. The concept of electrical distance is exploited showing how the electrical length reduces with increase in flatness or number of compensating stations. The theory developed has been implemented on a practical transmission line with known parameters and the results are presented and analyzed.

Keywords : Reactive compensation, voltage profile, Flatness Index, long line

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